



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
-----------------	-------------	----------------------	---------------------	------------------

10/530,517

08/26/2005

Esko Niemela

43315-216724

5769

26694

7590

05/12/2010

VENABLE LLP

P.O. BOX 34385

WASHINGTON, DC 20043-9998

EXAMINER

OLSEN, LIN B

ART UNIT

PAPER NUMBER

3661

MAIL DATE

DELIVERY MODE

05/12/2010

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/530,517	Applicant(s) NIEMELA ET AL.	
	Examiner LIN B. OLSEN	Art Unit 3661	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 10 February 2010.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-37 and 39-43 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-3, 6-37, 39-40 and 43 is/are rejected.
- 7) ☒ Claim(s) 4-5 and 41-42 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 07 April 2005 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

This action is in response to the filing on February 4, 2010 of a response to the Office Action of August 4, 2009. The application current contains 42 claims with claims **1, 21 37, 39 and 43** being independent.

Claim Objections

Claim **39** is objected to because of the following informalities: In the preamble, the construction “interface for carrying out at least one of controlling or monitoring and a tool operatively connected” is not understood. The examiner inquires whether “and” should be deleted? If not an explanation of the claim is requested. Appropriate correction is required.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claim **20** recites the limitation “the robot control unit” in line 4. There is insufficient antecedent basis for this limitation in the claim. In examining the claim, the Examiner will presume “a supervisory controller” from claim 1 was meant.

Claim **37** recites the phrase “and/or” which renders the claim indefinite because it is unclear whether either one or both of the actions listed are part of the claimed invention.

Claim Rejections - 35 USC § 101

The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

Claim **37** is rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter. The specification in the last paragraph of the Summary of the invention states: "In another aspect of the invention a computer data signal embodied in a carrier wave is described". There does not appear to be sufficient structural and functional interrelationships between the computer program and other claimed elements of a computer or processor which permit the computer program's functionality to be realized. In the instant case, although the computer program product does have a man-made tangible embodiment, - a computer readable medium, because the broadest reading of the claim could include a signal embedded in a carrier wave it is not statutory. When the broadest reasonable interpretation of a claim covers a signal *per se*, the claim must be rejected under 35 U.S.C. 101 as covering non-statutory subject matter. See *In re Nuijten*, 500 F.2d 1346, 1356-57 (Fed. Cir. 2007) (transitory embodiments are not directed to statutory subject matter). Claim 37 may be amended to narrow the claim to cover only statutory embodiments by adding the limitation "non-transitory" between "a" and "computer readable".

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

Claims **1-3, 6-8, 14, 20-24, 27 and 32-37** are rejected under 35 U.S.C. 102(a) as being anticipated by U.S. Patent Pub. No. 2003/0060810 to Syrowicz et al. (Syrowicz). Syrowicz describes a method and apparatus for treating undesired presences on the skin of an individual using a robot arm to position a laser and camera mounted on the robot arm. A controller is positioned remote from the robot and communicates with a robot arm controller (RACU) and a laser/camera controller (LCU) wirelessly (as one alternative). Referring to Fig. 1 of Syrowicz, communication links 14 and 16 between the CPU 12 and the LCU 20 are wireless links as described in Para. 14. Communication link 18 between the CPU 12 and RACU 26 is similarly a wireless link as described in Para. 14. Laser 22 and camera 20 constitute the tool that is operatively connected to the robot arm 28 and is controlled through the LCU which is the control unit and communications module as also described in Para 14. RACU 26 is the robot controller which includes a robot control unit and communications module as also described in Para 14. CPU 12 and memory 46 constitute the supervisory controller of the system 10.

Regarding independent **claims 1, 21 and 37**, which are apparatus, method and computer product claims of the same entity, **A wireless controller for at least one of controlling or monitoring a tool operatively connected to an industrial robot, the controller comprising:** - See abstract.

a wireless communication module operatively connected to the tool and comprising a processor having a communication function module configured to handle wireless communication to and from said tool - Syrowicz describes a wireless link between the CPU and tool, inherent in a wireless link is a wireless

Art Unit: 3661

communication facility to handle the wireless communication at each end of the link.

and a control unit configured to carry out at least one control function for one or more actuators of said tool; and - in Para. 15, it is stated that the laser can be

actuated to treat the skin and in Para 14, control of a laser joint to position the laser and camera is described.

a supervisory controller physically separate from the industrial robot and configured to wirelessly send signals to the wireless communication module to control operation of the tool. - CPU and Memory are shown separate from the robot arm and wireless links 14 and 16 send signals to the tool's wireless control capability.

Regarding **claim 2, The wireless controller according to claim 1, wherein the control unit comprises at least one computer program executable by said processor configured to handle the wireless communication.** - LCU 20 contains a processor (see where LCU controls the movement of the laser using the laser joint 40 in Para. 14) that performs the functions inherent in wireless communications.

Regarding **claim 3, The wireless controller according to claim 1, wherein the control unit configured is further to process a signal from at least one sensor operatively connected to the tool.** – See Para. 18, where camera (part of LCU) forwards visual information to CPU 12.

Art Unit: 3661

Regarding **claim 6, The wireless controller according to claim 1, wherein the control unit further comprises a program configured to carry out at least one of receiving or storing operational data of said tool.** – See Para. 17 where camera produces image of 500 by 500 pixels.

Regarding **claim 7, The wireless controller according to claim 6, further comprising:**

a memory configured to store operational data. – Memory 46

Regarding **claim 8, The wireless controller according to claim 6, wherein the control unit further comprises a computer program configured to process the operational data of said tool.** – See Para 18, camera processes visual information.

Regarding **claim 14, The wireless controller according to claim 1, wherein the control unit further comprises a control loop configured to receive an input signal from a high level control system and to generate a control signal to said tool dependent on the input signal from the high level control system.** – paras. 18 and 19 describe higher level processing done in the CPU, which leads in Para. 20 to where the higher level unit positions the laser and then sends an actuate command which causes the laser 22 to produce a laser beam 44 to perform treatment.

Art Unit: 3661

Regarding **claim 20, The wireless controller according to claim 1, further comprising:**

a wireless input/output module configured to provide wireless I/O functions between the robot control unit and said tool, wherein the wireless input/output module is arranged on or in relative proximity to the industrial robot. - The control unit of the LCU 20 supports wireless communications between the CPU and the LCU and is included in the LCU mounted to the robot.

Regarding **claim 22, The method according to claim 21, further comprising sending the second control signal with a hardware input/output interface of the wireless controller.** – Given that the summary of the invention has identified the LCU/laser/camera as a subsystem that communicates with the supervisory controller wirelessly, focuses and takes images of a field of interest, and actuates the laser after it is positioned, it is inherent that the subsystem has a hardware interface between the LCU and the laser and camera and that unique control signals pass through this interface with the LCU.

Regarding **claim 23, The method according to claim 21, further comprising storing operational data for said tool in a memory of the wireless controller.**
– Para. 18 reports that the specific points of interest for lasing are stored in memory 46.

Regarding **claim 24, The method according to claim 21, further comprising**

Art Unit: 3661

storing an in-signal and a result signal sent out in a memory of the wireless controller. - In Para. 17 it is reported that a typical image is sent to the CPU for analyzing, so it must be stored in memory. As a result of computation each treatment position (defined in terms of position of joints 30₁, 30₂, 30₃, and 40 is stored in memory (Para. 20). This is the data sent out to control the positioning of the tool.

Regarding **claim 27, The method according to claim 21, further comprising providing diagnostic information based on an operational data.** – Para. 21 describes a technician monitoring the progress and making modifications to calibrate the system. Calibration is one action in diagnostics.

Regarding **claim 32, The method according to claim 21, further comprising: providing wireless I/O functions between the robot control system and the tool arranged on or in relative proximity to the industrial robot.** - The tool and its controller, the robot arm controller and the supervisory controller are all in wireless communications with each other.

Regarding **claim 33, The method according to claim 21, wherein the method carries out at least one of controlling and monitoring a tool arranged with an industrial robot to carry out the operation of any one from the list of: welding, soldering, riveting, painting, gluing, folding plate, bending plate, hemming plate,**

Art Unit: 3661

gripping an object, manipulating an object. – by positioning the laser and removing a surface feature from the object being scanned, the object is manipulated.

Regarding **claim 35, The method according to claim 21, wherein the wireless controller is operated by a human operator to carry out at least one of controlling and monitoring the tool.** – Para. 21 discusses the technician monitoring the progress of the CPU.

Regarding **claim 36, The method according to claim 21, wherein the wireless controller comprises a process running on one or more computers to carry out at least one of supervising and controlling the tool.** – As shown in Fig. 1, there are processors in the CPU 12, the RACU 26 and the LCU 20. The flow charts of Figs. 2 and 3 illustrate the processor or supervising and controlling the tool.

Claim Rejections - 35 USC § 103

The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

Claims **9, 11-13, 26, 39 and 40** are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent Pub. No. 2003/0060810 to Syrowicz.

Regarding **claim 9 and 26, The wireless controller according to claim 6, wherein the control unit further comprises an output configured to communicate data dependent on the stored operational data to a display.** – See Background of

Art Unit: 3661

invention where it is old technology in the art to connect visualization means (camera in this case) to a display for technician monitoring. Further note Para. 21 where it is stated that a system technician can monitor the progress of the CPU 12 and make modifications to calibrate the system. It would have been obvious to one of ordinary skill in the art at the time of the invention to retain the old configuration with a display connected to the CPU 12 as means for the technician to monitor progress.

Regarding **claim 11, The wireless controller according to claim 9, wherein the output of the control unit is configured to communicate the stored operational data via the wireless communication module.** - Since the display would be connected to the CPU and the control unit communicates to the CPU through the wireless communications, the output of the control unit would travel through the wireless communication facility to reach the CPU.

Regarding **claim 15, The wireless controller according to claim 14, wherein input/output signals of the control loop of the control unit are compatible with a high level language.** – The software described in paras. 18 and 19 is not stated to be written a high-level language, but tasks such as contour finding, analyzing colors, and using artificial intelligence are known to have high-level languages written to support them. It would have been obvious to one of ordinary skill in the art at the time of the invention to use high-level language to support these tasks which supply control signals used in the control loop.

Regarding **claim 16, The wireless controller according to claim 6, further comprising:**

an additional processor configured to carry out at least one of receiving and storing operational data of said tool. – Since the CPU 12 is not described in detail in Syrowicz, it would have been within the capabilities of a designer of such a system to use a multi-processor CPU to accomplish the tasks of either receiving or storing the operation data of the LCU.

Regarding independent **claim 39, A graphical user interface for carrying out at least one of controlling or monitoring and a tool operatively connected to an industrial robot, comprising:**

a display of operational data of the tool provided by a wireless controller comprising a wireless communication module operatively connected to the tool and comprising a processor having a communication function module configured to handle wireless communication to and from said tool, and a control unit configured to carry out at least one control function for one or more actuators of said tool, and a supervisory controller physically separate from the industrial robot and configured to wirelessly send signals to the wireless communication module to control operation of the tool. – See comments associated with claim 9 about incorporating a display in the system, in particular connected to CPU 12. Given that the tool is being used to examine an area and identify targets in the area, a graphic

Art Unit: 3661

display rather than a text display was used in the prior art when a technician was selecting the target. In this case the graphic display is used to monitor the tool operatively connected to the robot.

Claims **31 and 34** are rejected under 35 U.S.C. 103(a) as being unpatentable over Syrowicz as applied to claims **21** above, and further in view of U.S. Patent Pub. No. 2004/0148058 to Johannessen et al. (Johannessen). Johannessen is concerned with wireless control of a robot manipulator from a portable operating unit and in particular with controlling multiple robot controllers with one operating unit.

Regarding **claim 31 and 34, The method according to claim 21, further comprising:**

downloading operational information and/or configuration data stored in the wireless controller to at least one of a second wireless controller or a second tool neither of which are mounted on the robot. - While Fig. 1 shows one supervisory controller supervising only one robot and tool; but Johannessen in its Fig. 4 shows one base station 40 controlling six robots 3(a-f) with associated tools. It would have been obvious to one of ordinary skill in the art at the time of the invention to use Johannessen's addressing technique to control more than one RACU/LCU from the supervisory controller

Claims **10, 12-13, 17-19, 25, 28-30, 40 and 43** are rejected under 35 U.S.C. 103(a) as being unpatentable over Syrowicz as applied to claims **1, 21 and 39**

Art Unit: 3661

above, and further in view of U.S. Patent Pub. No. 2002/0173877 to Zweig and further in view of U.S. Patent Pub. No. 2004/0034448 to Siegers. Zweig is concerned with a mobile robotic device with both a web server and digital radio links. Siegers is concerned with using short ranged wireless service to communicate with a robotic tool in a semiconductor furnace.

Claims **10, 12-13, 17-19, 25, 28-30, 40 and 43** each recite a feature of previous claims with the addition of a limitation on the messaging means, hardware wireless capability used, or protocol used in sending commands or data between the supervisory controller and the tool controller. The Examiner maintains that a choice of communications capability is well within the capabilities of one of ordinary skill in the art of computer controlled robots at the time of the invention. For instance, Siegers discusses communicating with the robot using a handheld device [0014]; in [0018] Siegers says that the wireless transceiver used can be any device operable to send and receive data and applications using radio frequency signals, infrared signals or any other means of wireless communications. In [0019] Siegers discusses Bluetooth wireless standard and other 2.4 GHz band wireless capabilities; In [0030] use of other LAN standards such as 801.11b is mentioned; In [0033] use of JAVA applets to implement web servers is discussed; In [0035-36] use of TCP/IP protocol and remote method invocation is discussed and in [0037] serialization as a communication method is discussed. Sweig, in a similar area at the same time adds to this discussion of communication capabilities the IEEE 802.11 and 802.15 protocols (abstract); [0008] recites that programming techniques to increase the power and flexibility of the Internet

Art Unit: 3661

had matured and a number of those newer programming techniques can be adapted to robotic control methods; In [0009] SGML, HTML, XML, XHTML use with Web pages is discussed and Paras. [0010-13] discuss various web interconnection strategies. In [0014] JAVA and web browsers are discussed; in [0027-0029] standard protocols such as PAN, HomeRF, SWAP, and Bluetooth™ are discussed. It would have been obvious to one of ordinary skill in the art at the time of the invention to vary the capabilities of the system described to incorporate the various communication facilities as claims in the listed claims.

Allowable Subject Matter

Claims **4, 5, 41 and 42** are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

The following is a statement of reasons for the indication of allowable subject matter:

The cited prior art neither teaches nor reasonably suggests that in a wireless controller for controlling or monitoring a tool operatively connected to an industrial robot, where the controller comprises. a wireless communication module operatively connected to the tool and having a processor with 1. a communication function module configured to handle wireless communication to and from the tool and 2. a control unit configured to carry means out at least one control function for one or more actuators of the-tool; and a supervisory controller physically separate from the industrial robot and configured to wirelessly send signals to the wireless communication module to control

Art Unit: 3661

operation of the tool, that a configurable hardware input/output interface part of the wireless controller and should be integrated in one unit with the processor

Further the cited prior art neither teaches nor reasonably suggests that a graphical user interface for carrying out controlling or monitoring a tool operatively connected to an industrial robot, comprising: a display of operational data of the tool provided by a wireless controller comprising a wireless communication module operatively connected to the tool and comprising a processor having a communication function module configured to handle wireless communication to and from said tool, and a control unit configured to carry out at least one control function for one or more actuators of said tool, and a supervisory controller physically separate from the industrial robot and configured to wirelessly send signals to the wireless communication module to control operation of the tool. Should combine a graphical representation of a relevant production cell or part thereof with the operational data values that are displayed. Further the prior art does not suggest that operational data values displayed are arranged to be displayed upon activation of a part of the graphical representation of the relevant production cell or part thereof using a computer mouse, joystick, touch screen or similar computer display selection element.

Response to Arguments

Applicant's amendments to the claims have overcome:

The objections to claims **14, 17, 19, 25, 34 and 39**;

The rejection under 35 USC 112 1st paragraph of claims **24, 27 and 33-36**;

The rejection under 35 USC 112 2nd paragraph of claims **1, 6, 8, 9, 12, 21, 31, 33-36, 39 and 43**; and

The rejection under 35 USC 101 of claims **33-36**.

Applicant's arguments, see Pages 13-19 filed February 4, 2010, with respect to the rejection(s) of claim(s) 1-43 under 112, 101, 102 and 103 have been fully considered and are persuasive. Therefore, the rejection has been withdrawn. However, upon further consideration, a new ground(s) of rejection is made in view of U.S. Patent Pub. No. 2003/0060810 to Syrowicz.

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any

Art Unit: 3661

extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to LIN B. OLSEN whose telephone number is (571)272-9754. The examiner can normally be reached on Mon - Fri, 8:30 -5.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Thomas G. Black can be reached on 571-272-6956. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Lin B Olsen/
Examiner, Art Unit 3661

/Thomas G. Black/
Supervisory Patent Examiner, Art Unit 3661